

WHAT IS CLAIMED IS:

1. A purified polynucleotide encoding a Neu polypeptide, wherein said Neu polypeptide comprises at least one neuralized homology repeat domain and a C3HC4 RING-zinc finger domain, wherein the Neu polypeptide functions as a transcription regulator.

2. The purified polynucleotide of Claim 1, wherein the neuralized homology repeat domain comprises SEQ ID NO. 48.

3. The purified polynucleotide acid of Claim 1, wherein the nucleic acid has at least 85% homology to a sequence selected from the group consisting of SEQ ID NOs: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31 and 33.

4. The purified polynucleotide acid of Claim 1, wherein the nucleic acid has at least 90% homology to a sequence selected from the group consisting of SEQ ID NOs: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31 and 33

5. The purified polynucleotide acid of Claim 1, wherein the nucleic acid has at least 95% homology to a sequence selected from the group consisting of SEQ ID NOs: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31 and 33.

6. The purified polynucleotide of Claim 1, wherein said polynucleotide comprises a sequence selected from the group consisting of SEQ ID NOs: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31 and 33.

7. An isolated polynucleotide capable of hybridization under stringent hybridization conditions to a sequence selected from the group consisting of SEQ ID NOs: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31 and 33.

8. The isolated polynucleotide of Claim 7, wherein the stringent hybridization conditions comprise hybridization of the isolated polynucleotide in the presence of 2 x SSC/0.1% SDS at about room temperature.

9. The isolated polynucleotide of Claim 7, wherein the stringent hybridization conditions comprise hybridization of the isolated polynucleotide in the presence of 2 x SSC/0.1% SDS at about 42°C.

10. The isolated polynucleotide of Claim 7, wherein the stringent hybridization conditions comprise hybridization of the isolated polynucleotide in the presence of 2 x SSC/0.1% SDS at about 68°C.

11. A purified Neu polypeptide, wherein said Neu polypeptide comprises at least one neuralized homology repeat domain and a C3HC4 RING-zinc finger domain.

12. The purified Neu polypeptide of Claim 11, wherein the neuralized homology repeat domain comprises SEQ ID NO. 48.

5 13. The purified Neu polypeptide of Claim 11, wherein the polypeptide comprises an amino acid sequence with at least 80% sequence homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32 and 34.

10 14. The purified Neu polypeptide of Claim 11, wherein the polypeptide comprises an amino acid sequence with at least 85% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32 and 34.

15 15. The purified Neu polypeptide of Claim 11, wherein the polypeptide comprises an amino acid sequence with at least 90% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32 and 34.

20 16. The purified Neu polypeptide of Claim 11, wherein the polypeptide comprises an amino acid sequence with at least 95% homology to an amino acid sequence selected from the group consisting of SEQ ID NO: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32 and 34.

17. The purified Neu polypeptide of Claim 11, wherein the polypeptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32 and 34.

25 18. An antibody capable of specifically binding to a Neu polypeptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32 and 34.

19. The antibody of Claim 18, wherein said antibody specifically binds to a polypeptide comprising at least 10 consecutive amino acids of said protein.

30 20. The antibody of Claim 18, wherein the antibody is a monoclonal antibody.

21. An expression vector comprising a polynucleotide according to Claim 1.

22. The expression vector of Claim 21, wherein the vector is a plasmid.

23. A host cell containing the expression vector of Claim 21.

24. A method of making a Neu protein comprising:

obtaining a nucleotide sequence comprising a nucleotide sequence encoding a

5 Neu protein;

inserting said nucleotide sequence in an expression vector such that said nucleotide sequence is operably linked to a promoter; and

introducing said expression vector into a host cell whereby said host cell produces a protein encoded by said nucleotide sequence.

10 25. The method of Claim 24, wherein the Neu polypeptide encoding nucleotide sequence is selected from the group consisting of SEQ ID NOs: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31 and 33.

26. The method of Claim 24, further comprising isolating said protein.

15 27. A vector comprising a Neu polypeptide encoding nucleotide sequence, wherein said nucleotide sequence is operably associated with a promoter.

28. The vector of Claim 27, wherein the Neu polypeptide encoding nucleotide sequence is selected from the group consisting of SEQ ID NOs: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31 and 33.

20 29. A method of constructing a transformed host cell that expresses a Neu protein comprising:

providing a Neu protein encoding polynucleotide sequence capable of expressing the encoded Neu protein; and

transforming a host cell with Neu protein encoding polynucleotide.

25 30. A method of identifying a binding partner that interacts with a Neu family protein comprising:

providing a support comprising a Neu protein or a functional fragment thereof;

contacting the support with a candidate binding partner; and

30 detecting a biological complex comprising the Neu protein and the candidate binding partner, wherein detection of such complex indicates that said candidate binding partner interacts with the Neu protein.